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NEW SPECIES OF PHYLLODOCIDAE AND HESIONIDAE (POLYCHAETA), PRINCIPALLY FROM FLORIDA

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Abstract.—The following new species are described: *Eumida* (*Eumida*) *parvicirrus, Eumida* (*Pirakia*) *hutchinsonensis, Paranaitis gardineri, Heteropodarke lyonsi, H. formalis, Kefersteinia haploseta,* and *Podarkeopsis levifuscina. Kefersteinia* sp. is informally described. *Oxydromus arenicolus glabrus* Hartman, previously referred to *Oxydromus brevipalpa* Hartmann-Schröder, is a distinct species which, with *O. brevipalpa, Oxydromus capensis* Day, and *Gyptis maraunibinae* Gibbs, are species of *Podarkeopsis* Laubier, and new combinations.

This report is one of several (Perkins 1979, 1980, 1981, 1984) based primarily on collections made between September 1971 and July 1973 in an environmental baseline study of marine biota near the Florida Power and Light Company nuclear power plant at Hutchinson Island, St. Lucie County, Florida. Additional specimens collected later at Hutchinson Island and specimens from North Carolina and the eastern Gulf of Mexico are included. A species of Hesionidae, *Microphthalmus hartmanae,* has been described previously from these collections (Westheide 1977), and another *Microphthalmus* species awaits description (Wilfried Westheide, in litt.).

The study area and methods were described by Gallagher and Hollinger (1977). Sediments were described by Gallagher (1977). Other aspects of the physical and chemical environment were reported by Worth and Hollinger (1977). Brief descriptions of benthic sampling stations and methods were also given by Perkins (1979).

Types and other material available for study are deposited in the Allan Hancock Foundation, University of Southern California (AHF); British Museum (Natural History) (BMNH); Invertebrate Reference Collection of the Florida Department of Natural Resources Bureau of Marine Research (FSBC I); Marine Environmental Sciences Consortium, Dauphin Island, Alabama (MESC); Mote Marine Laboratory, Sarasota, Florida (MML); U.S. National Museum of Natural History, Smithsonian Institution (USNM); Universitetets Zoologiske Museum, Copenhagen (ZMC); and Zoologisches Institut und Zoologisches Museum, Hamburg University (ZMH).

Dr. Marian H. Pettibone (USNM), Dr. Thomas Hopkins (MESC), and Mr. Jay Leverone (MML) loaned specimens. Mr. Robert G. Ernest, Applied Biology, Inc., Jensen Beach, Florida, and Mr. Harvey Rudolph, Florida Department of Environmental Regulation, donated specimens. Specimens of *Kefersteinia* sp. loaned by Mr. Leverone were collected and identified by personnel of Mote Marine Laboratory for the Bureau of Land Management, contract no. AA815-CTO-50. James F. Quinn, Jr., of the Bureau of Marine Research helped with the Latin names. Kristian Fauchald (USNM) provided a copy of a description not available

to me. Kristian Fauchald, Karen A. Steidinger and William G. Lyons critically read the manuscript. Many other individuals from the Bureau of Marine Research and from Applied Biology, Inc., participated in the Hutchinson Island study for which Florida Power and Light Company provided partial funding.

Family Phyllodocidae Williams, 1851
Genus *Eumida* Malmgren, 1865, emended

Diagnosis.—Body usually long, with numerous segments. Prostomium cone-shaped, oval, pear-shaped, or heart-shaped, with 2 eyes and 5 antennae. First segment reduced dorsally, visible laterally and ventrally, other tentacular segments complete and distinct from one another; 4 tentacular cirri, all cirriform, or ventral cirri of segment 2 slightly flattened and oval in cross section. Tentacular formulae:

$$1 + S\frac{01}{al} + S\frac{01}{an} \quad \text{or} \quad 1 + 0\frac{01}{al} + S\frac{01}{an}$$

Parapodia uniramous, with only compound setae; dorsal cirri oval, lanceolate or heart-shaped, ventral cirri originating near ventral margin, and equal to or smaller than setal lobes in posterior view, with axis parallel to aciculum or diverging ventrally. Proboscis smooth or nearly so or diffusely covered with conical, rounded, or cylindrical papillae, not divided into 2 regions when everted. (Diagnosis modified from Hartmann-Schröder 1971, incorporating characters of ventral cirrus suggested by Banse 1973.)

Remarks.—The systematics of *Eumida* Malmgren, 1865, s.s., and related genera (e.g., *Pirakia* Bergström, 1914; *Sige* Malmgren, 1865; and *Pterocirrus* Claparède, 1868) is complicated and somewhat confused. A system based on principles proposed by Bergström (1914), with minor emendations and additions by later authors, was given by Fauchald (1977:45–51). Fauchald retained the identities of most genera maintained or described by Bergström. Other authorities (e.g., Day 1967; Hartmann-Schröder 1971; Uschakov 1972; Banse and Hobson 1974) included some related genera of Fauchald's system within the genus *Eumida,* with or without subgeneric status, or included these, *Eumida,* and still other genera of Fauchald's system as subgenera of *Eulalia* Savigny, 1817. *Eumida* and related genera differ from *Eulalia* in having a dorsally reduced first segment; however, see Banse (1973) for a discussion of reservations concerning the importance of this character.

Of the four generic taxa I consider related, *Pirakia* differs from *Eumida* in the degree and type of papillation of the proboscis. This may be an important generic character; Hartmann-Schröder (1971) stated that the proboscis of the type-species of *Eumida, Eulalia sanguinea* Örsted, 1843, was smooth or wrinkled only from contraction, whereas the proboscis of the type-species of *Pirakia, Phyllodoce* (*Eulalia*) *punctifera* Grube, 1860, was diffusely covered with small, conical papillae. However, there may be intermediate conditions of this character; other authorities (e.g., Pettibone 1963; Day 1967; Uschakov 1972) have described oval bumps or scattered papillae of various shapes on specimens reported as *Eumida sanguinea* and other *Eumida* species. These may prove to be incorrectly identified, and the apparent intermediate conditions may not exist. Therefore, I am retaining *Pirakia,* but only as a subgenus of *Eumida.*

Sige and *Pterocirrus,* the two remaining similar generic taxa, differ from *Eumida*

in having broadly lamellate ventral tentacular cirri on segment 2; I consider this an important generic character. In the strict sense, these genera differ from each other in the setation of tentacular segments, *Sige* having setae on segments 2 and 3, and *Pterocirrus* lacking setae but apparently having acicula on those segments (Banse 1959; Uschakov 1972). However, a form described from Japan [*Sige macroceros* (Grube, 1860) variety *orientalis* Imajima and Hartman, 1964:70, pl. 14, figs. c–f] is apparently intermediate between these character states. (This varietal designation has no status according to the International Code of Zoological Nomenclature 1964, Article 45.) The form has setae on segment 3, suggesting that setation of anterior segments is not an important generic character for this group, and that *Sige* and *Pterocirrus* constitute but a single genus without subgenera. This is in strict agreement with the system of Uschakov (1972). Lack of importance of setation of anterior segments as a generic character is further supported by intraspecific variation in this character noted in the species of *Eumida* (*Pirakia*), below.

Uschakov used *Pterocirrus* Claparède rather than the older name *Sige* Malmgren for this taxon. He believed, after examination of a specimen from the Öresund, near the type-locality, that Malmgren's original description and figure of *Sige fusigera* (Malmgren 1865:100, pl. 14, fig. 27), the type-species, were correct and concluded that *Sige fusigera* was a species of *Eumida* Malmgren. However, Bergström (1914) stated earlier that he had examined the holotype of *S. fusigera* deposited in the Swedish State Natural History Museum and other specimens of the species from the type-locality north northwest of the Öresund along the southern Norwegian and Swedish west coast. The "holotype" he examined [which should only be considered part of Malmgren's original material, according to Kristian Fauchald (pers. comm.)] was damaged. The proboscis was torn loose from the mouth, and the part visible was the inner coelomic lining. This is suggested by Malmgren's figure and is a condition common on one of the species described below. Bergström also stated that ventral tentacular cirri of the second segment were lamelliform and that the proboscis was diffusely papillate. At this time, Bergström's arguments are more convincing than those of Uschakov, and I continue to maintain Bergström's concept of *Sige* Malmgren, but as modified by Uschakov under the name *Pterocirrus* Claparède. However, it is certainly possible that Malmgren had both the species reported as *Eumida fusigera* by Uschakov (1972) [here considered a *Eumida* species] and also the species reported by Bergström (1914) as *Sige macroceros* [not *Phyllodoce* (*Eulalia*) *macroceros* Grube, 1860, fide Banse (1959) but here considered to be *Sige fusigera* Malmgren, 1865]. This matter warrants further investigation.

Additionally, I include in *Eumida* species having slightly flattened ventral tentacular cirri on segment 2. These occur on the species of *Eumida* (*Pirakia*) described below, on the species reported as *Eulalia* (*Eumida*) *sanguinea* [not *Eulalia sanguinea* Örsted, 1843] by Day (1967:155, fig. 5.5.A–C) from southern Africa, and probably on *Eulalia* (*Sige*) *falsa* Day (1960:303, fig. 6A–C; 1967:155, fig. 5.5.D–F). There is a great difference between the slightly flattened ventral tentacular cirri of these species and the broadly lamellate ones of *Sige* (see Claparède 1868:560–562; 1869: pl. 17, fig. 2; and Bergström 1914:70, text figure 23f–g for descriptions and figures of ventral tentacular cirri of segment 2 of *Sige*).

Finally, the intraspecific variation in setation of anterior segments noted in the

description of the species of *Eumida* (*Pirakia*), below, seems to require that the limits of *Eumida* be expanded. Accordingly, I have emended the generic diagnosis to include all specimens of this species by the addition of a second setal formula indicating that setae may be absent from segment 2.

Subgenus *Eumida* Malmgren, 1865

Diagnosis.—Proboscis smooth or with scattered papillae, bumps, wrinkles, folds, or warts of various shapes.

Eumida (*Eumida*) *parvicirrus,* new species
Fig. 1

Material examined.—FLORIDA: Hutchinson Island Sta II, 27°21.6′N, 80°13.2′W, 11 m, coarse calcareous sand, holotype (USNM 80510). Same, Sta V, 27°22.9′N, 80°13.9′W, 11 m, coarse calcareous sand, paratype (USNM 80511).

Description.—Dorsum of holotype brown on segments 2–6, posterior lobes of brain mass brown (Fig. 1A), internal pigmented areas ventromedial to ventral cirri (Fig. 1C). Holotype complete, 3 mm long excluding proboscis, 30 segments; complete paratype smaller, about 2 mm long, 20 segments. Prostomium oval-pentagonal (Fig. 1A), about twice as broad as long; posterior margin almost straight; frontal antennae moderately slender, subulate; median antenna shorter and more slender than frontal ones, originating slightly in front of level of eyes; eyes posterolateral. First segment reduced dorsally, visible only laterally and ventrally. Tentacular formula:

$$1 + S\frac{01}{al} + S\frac{01}{an}$$

Setal lobes of segment 2 small, conical, with several setae. Tentacular cirri slender, subulate, about ⅔ as long as prostomial width on segment 1; upper cirri on segment 2 longest, extending to about segment 7; ventral cirri of segment 2 slightly longer than those of segment 1; dorsal tentacular cirri of segment 3 almost as long as upper cirri of segment 2. Dorsal cirri (Fig. 1B, C) similar throughout, only slightly smaller on anteriormost and far posterior setigers, on short cirrophores, pyriform, extending to tips of setal lobes or shorter, about 1½ times longer than wide, with thickness equal to ½ width. Setigerous lobes conical; each with short filiform presetal lobe above aciculum, with obscure, rounded, postsetal lobe, with relatively long, slender aciculum extending into presetal lobe. Ventral cirri subulate or fusiform, about as long as dorsal cirri, about ½ as wide, not extending past tips of setigerous lobes. Setae (Fig. 1D–F) numbering about 20 per parapodium in middle segments, with slender shafts and slender, spinigerous blades; shafts with about 6 short, slender spines on tips; blades with short serrations on edge. Anal cirri missing.

Proboscis (Fig. 1A) relatively short and bulbous when everted, with smooth surface; distal opening, when fully everted, surrounded by 15–20 soft, semicircular lobes.

Remarks.—*Eumida parvicirrus* is a small species for the genus. Setigerous lobes, ventral cirri, and possibly setae are similar to those of the specimen reported as

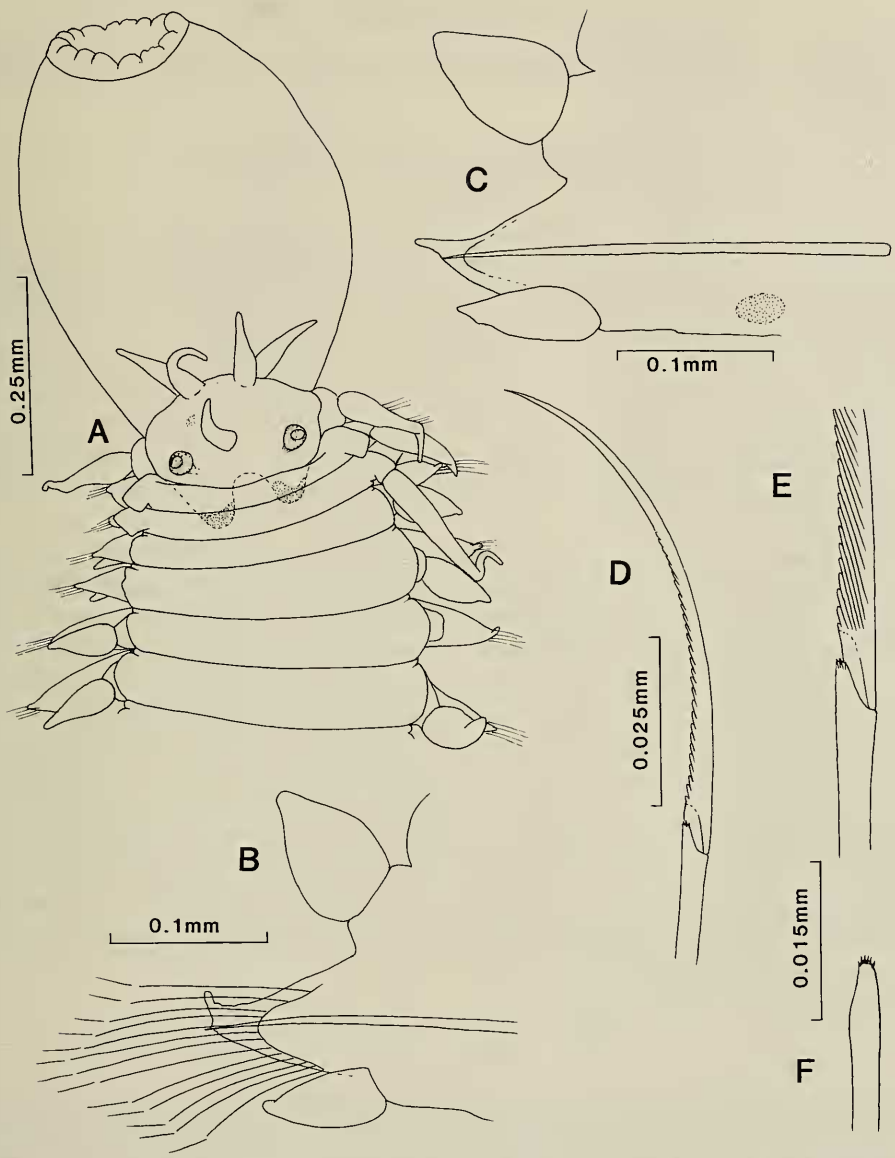

Fig. 1. *Eumida* (*Eumida*) *parvicirrus,* holotype: A, Anterior end, dorsal view; B, Parapodium, middle segment, posterior view, with about half of setae figured; C, Same, setae omitted; D, Seta, lateral view; E, Same, enlarged view of hinge region; F, Tip of shaft, face view.

Eumida fusigera by Uschakov (1972) [not *Sige fusigera* Malmgren]. However, the proboscis of *E. parvicirrus* is smooth and dorsal cirri are not as slender. *Eumida parvicirrus* appears to be unique in the genus in having relatively large posterior lobes of the brain mass, the posterior parts of which are pigmented.

Etymology.—The specific name is derived from the Latin *parvus,* small, and *cirrus,* curl, and refers to the small cirri of setigerous segments.

Subgenus *Pirakia* Bergström, 1914

Diagnosis.—Proboscis diffusely covered with conical, rounded, or cylindrical papillae.

Eumida (*Pirakia*) *hutchinsonensis,* new species
Figs. 2, 3

Material examined.—FLORIDA: Hutchinson Island Sta V, 27°22.9′N, 80°13.9′W, 11 m, coarse calcareous sand, holotype (USNM 80515), 29 paratypes (USNM 80517, 80519, 80520; AHF Poly 1390; BMNH 1983.931–937; FSBC I 30418; ZMC; ZMH P-17602). Same, Sta II, 27°21.6′N, 80°13.2′W, 11 m, coarse calcareous sand, 17 paratypes (USNM 54278, 80516, 80518; FSBC I 30419, 30420). Same, Sta IV, 27°20.7′N, 80°12.8′W, 11 m, coarse calcareous sand, 1 paratype (FSBC I 30421). Off Cape Canaveral, 28°35.9′N, 80°18.6′W, 26 m, on scallops, 9 specimens (FSBC I 17407). Off Palm Beach County-Broward County line S of Boca Raton, on *Phragmatopoma lapidosa* Kinberg, 1 specimen (USNM 80521).

Description.—Color variable, tan to dark brown; tan specimens with few scattered pigment spots more prominent on antennae, tentacular cirri, dorsal cirri, and ventral cirri; dark-brown specimens with numerous pigment spots on prostomium and dorsum of body; spots prominent in transverse segmental bands; dorsal and ventral cirri of dark-brown specimens also strongly pigmented, darker than body; many specimens with color intermediate between these extremes. Complete type-specimens less than 10 mm long, with maximum of 75 segments. Prostomium (Fig. 2A, B) rounded-pentagonal, longer than wide, with posterior margin almost straight; frontal antennae moderately stout, similar; median antenna originating from near middle of prostomium well in front of eyes, much shorter and more slender than frontal ones; pair of moderately large, brown, lensed eyes near posterior margin; moderately large, triangular lobe behind eyes. Segment 1 reduced dorsally, visible only laterally and ventrally, with tentacular cirri lateral to eyes. Tentacular formulae:

$$1 + S\frac{01}{al} + S\frac{01}{an} \quad \text{or} \quad 1 + 0\frac{01}{al} + S\frac{01}{an}$$

Segment 2 parapodia with 0–3 setae; some specimens with setae on both parapodia, others with setae on only one; about half of specimens without setae on this segment. Ventral tentacular cirri of segment 2 slightly flattened, oval in cross section; remaining tentacular cirri cirriform; dorsal cirri of segment 2 longest, reaching to about segment 8; setal lobes of segment 2 reduced or absent. Parapodia after segment 3 (Fig. 2C, D) with dorsal and ventral cirri, slightly bilobed presetal lobes and shorter, rounded postsetal lobes; single neuroaciculum and composite setae. Dorsal cirri short on anterior segments, gradually longer on anterior ⅓ of body, shorter near far posterior end, about twice longer than wide on middle segments, flattened, lanceolate to cordiform in outline, on cirrophores of moderate length; ventral cirri somewhat flattened, oval in outline, extending almost to tips of setal lobes, on short cirrophores; parapodia of middle segments with less than 10 setae. Setae (Fig. 3B–D) composite, with short, flattened, awl-shaped blades; blades with very fine, short serrations on edge, with pointed tips; shaft tips asymmetrical with several spines all of same size. Anal cirri (Fig. 3A) similar to dorsal

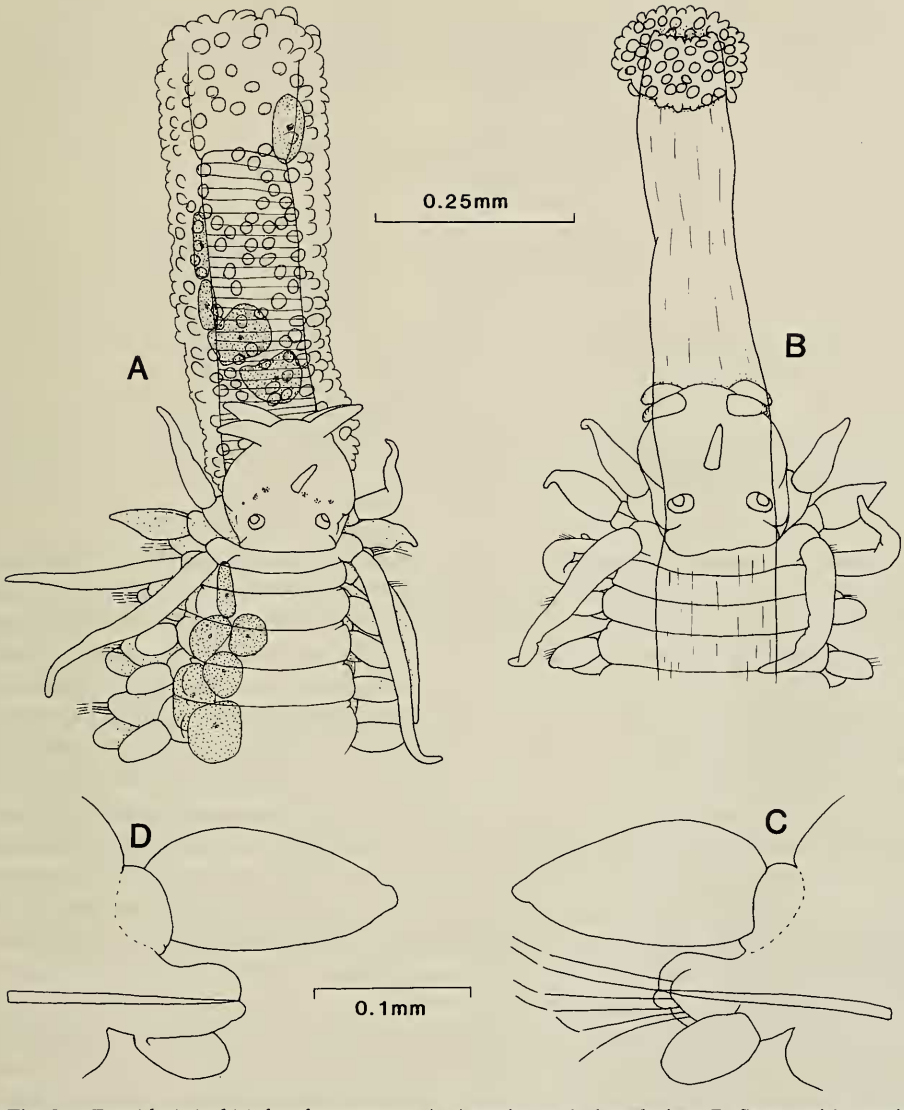

Fig. 2. *Eumida* (*Pirakia*) *hutchinsonensis*: A, Anterior end, dorsal view; B, Same, with proximal part of proboscis torn from mouth; C, Parapodium, middle segment, posterior view; D, Same, anterior view, setae omitted (A, USNM 80517; B, USNM 80516; C, D, USNM 80519).

cirri of middle segments, slightly thicker and longer, almost oval in outline on holotype.

Proboscis (Fig. 2A, B) in about anterior 23 segments when inverted, formed of papillate region in anterior 13 segments and thickly muscled region with numerous circular muscle rings in last 10 or so segments; proboscis when everted showing numerous, irregularly arranged, short papillae on all except possibly short proximal part near mouth, with distal opening surrounded by 12 rounded, soft papillae attached at anterior end of muscular part. Proboscis missing on several specimens; papillate part broken away from mouth on some others (Fig. 2B).

Many specimens with polygonal eggs in coelomic cavity (Fig. 2A).

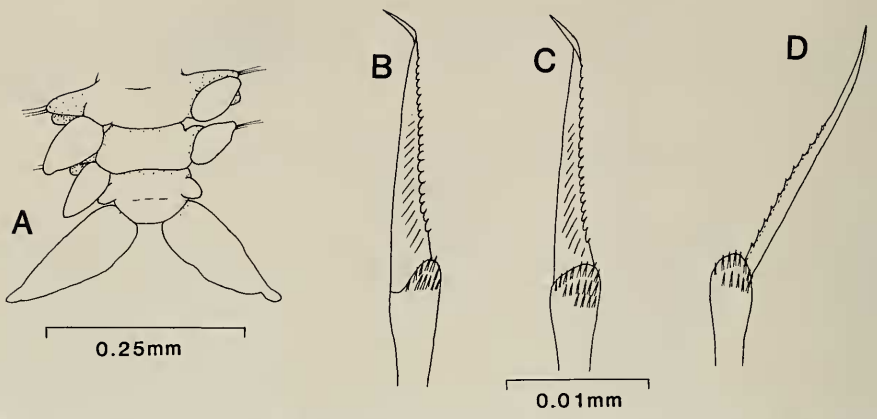

Fig. 3. *Eumida* (*Pirakia*) *hutchinsonensis*: A, Posterior end, dorsal view; B–D, Setae, various views (A, USNM 80516; B–D, FSBC I 30419).

Remarks.—Ventral tentacular cirri of segment 2 on most type-specimens of *Eumida* (*Pirakia*) *hutchinsonensis* are slightly flattened and oval in cross section. They are definitely flattened on a few type-specimens, but on another specimen (USNM 80521) collected north of Boca Raton, Florida on *Phragmatopoma,* they are cylindrical in cross section. The specimen is larger than the type-specimens, 17 mm long with about 100 segments, but I am certain the specimen is the same species. The structure of the proboscis is the same. The origin of the median antenna is the same, although it is relatively longer than on the smaller type-specimens. The shape of the setae is identical, although there are about 15 per parapodium on middle segments rather than 10 or less as on the type-specimens. There are no notopodial lobes on segment 2 of the larger specimen, and only two setae were found on one side of that segment, then only after removal of the parapodium. Parapodial lobes are similar, but dorsal cirri are more pointed on the larger specimen. Finally, the larger specimen is a female whose eggs are identical with those of the smaller specimens.

Eumida (*Pirakia*) *hutchinsonensis* differs from *E.* (*P.*) *punctifera* (Grube, 1860) (*Phyllodoce* (*Eulalia*) *punctifera.*—Grube, 1861:142, pl. 3, fig. 5; *Eumida* (*Pirakia*) *punctifera.*—Hartmann-Schröder, 1971:113, 114, Fig. 36A–C) in having a prostomium which is much longer than wide, in having a median antenna which originates from the middle of the prostomium rather than from between the eyes, and in having parapodia with only slightly bilobed presetal lobes. *Eumida* (*P.*) *hutchinsonensis* differs from *E.* (*P.*) *fuscescens* (Saint-Joseph, 1888) (*Eulalia fuscescens* Saint-Joseph, 1888:296, 297, pl. 12, figs. 163–165; *Eumida* (*Pirakia*) *fucescens.*—Hartmann-Schröder, 1971:113) in having subulate rather than filiform antennae and tentacular cirri and in having none to very few, rather than several, setae on parapodia of the second segment.

Eumida (*P.*) *hutchinsonensis* differs from *E.* (*P.*) *lanceolata* (Hartman and Fauchald, 1971:44–46, pl. 7) in having eyes and broader dorsal cirri and in lacking setal lobes on segment 2. *Eumida* (*P.*) *hutchinsonensis* differs from *E.* (*P.*) *brunnea* (Fauchald, 1972:53, 54, pl. 4, figs. c, d) in having eyes, numerous proboscidal papillae and broader dorsal cirri, and in lacking filiform lobes on tips of parapodia.

Eumida (*P.*) *hutchinsonensis* may have been previously reported from Florida by Rullier (1974:23, 24) as *Eulalia punctifera,* but I cannot confirm this.

Etymology.—The specific name refers to the type-locality.

Genus *Paranaitis* Southern, 1914
Paranaitis gardineri, new species
Fig. 4

Paranaitis polynoides.—Gardiner, 1976:110, fig. 6M–P [not *Anaitis polynoides* Moore, 1909].

Material examined.—NORTH CAROLINA: Cape Lookout, intertidal, sand mixed with gravel and shell fragments, S. L. Gardiner & C. J. Jenner, coll., 6 Apr 1974, holotype (USNM 52876), paratype (USNM 80523). Same, E. Powell, coll., 14 Feb 1975, paratype (USNM 52878). Intracoastal Waterway, Wrightsville Beach, intertidal, muddy sand, T. Fox and S. L. Gardiner, coll., 9 Mar 1974, 2 paratypes (USNM 52877). FLORIDA: Hutchinson Island Sta II, 27°21.6′N, 80°13.2′W, 11 m, coarse calcareous sand, 5 paratypes (FSBC I 30422–30424; USNM 80524; ZMH P-17600). Same, Sta IV, 27°30.7′N, 80°12.8′W, 11 m, coarse calcareous sand, 3 paratypes (AHF POLY 1391; BMNH 1983.938; FSBC I 30425). Same, Sta V, 27°22.9′N, 80°13.9′W, 11 m, coarse calcareous sand, 2 paratypes (FSBC I 30426, 30427).

Description.—Specimens from North Carolina (collected intertidally) highly colored (Fig. 4A, C) with diffuse purple spots on prostomium, tentacular segments, tentacular cirri, dorsum and ventrum of posttentacular segments, and dorsal cirri; color spots often on cirrophores of dorsal cirri and on proximal parts of ventral cirri. Segmental spots on dorsum often coalesced, forming almost uniform trapezoidal groups with anterior side narrower; medial and pair of lateral irregular lines of pigment spots on ventrum; dorsal cirri with up to 10 diffuse pigment spots on medial half of cirrostyles. Florida specimens (collected subtidally) almost all without color pattern; trace of color pattern noted above present on one specimen. Maximum length 95 mm, width 4 mm (Gardiner 1976); maximum length of preserved specimens 60 mm, width 3 mm, 180 segments; specimens from North Carolina more than twice as long as Florida specimens. Prostomium (Fig. 4a) about as long as wide; posterior half surrounded on dorsal side by fused segments 1 and 2, with nuchal papilla. Tentacular cirri of segment 3 longest, extending to about setiger 8; dorsal pair of segment 2 often about as long as ones on segment 3. Dorsal cirri (Fig. 4C–F) on distinct cirrophores; cirrostyles imbricated, thin, about as broad as or shorter than length of aciculum, small anteriorly, gradually longer toward middle, smaller near posterior end, with margins gradually curved or with obscure dorsolateral angle, with dorsal margin slightly longer than ventrolateral margin. Imbricated cirri exposing most of dorsum of body anteriorly, ⅓–½ of body on middle segments, ¼–⅓ of body on posterior segments. Setigerous lobes conical, with distally notched presetal lobes; upper parts of presetal lobes longer and broader than lower parts; postsetal lobes shorter, rounded. Ventral cirri extending about to tips of presetal lobes or slightly shorter, flattened, elongate-oval, with rounded tips, with dorsal margins usually concave, with ventral margins convex, originating on short, broad cirrophores or extensions of ventral parts of parapodia. Up to 30 compound spinigers per parapodium depending on body

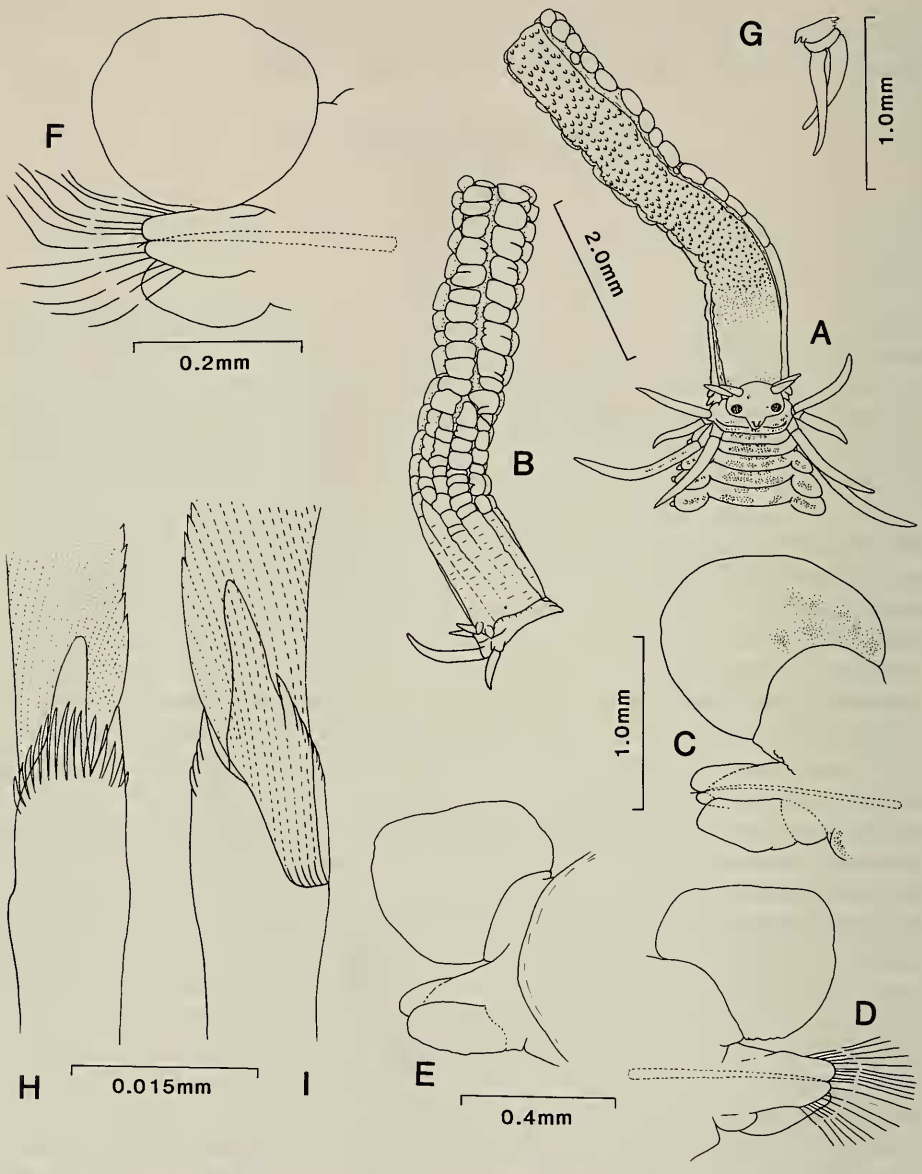

Fig. 4. *Paranaitis gardineri*: A, Anterior end, dorsal view; B, Ventrolateral view of same; C, Parapodium, posterior view; D, Same, anterior view; E, Same, posterior view; F, Same, anterior view, small specimen; G, Pygidium, dorsal view; H, Hinge region of seta, anterior view; I, Same, posterior view (A–C, G, holotype; D, E, BMNH 1983.938; H, I, USNM 80524).

size (Fig. 4D, F, H, I); blades flattened, serrated; shafts enlarged near tips, with large round-tipped tooth on anterior side, with row of numerous long spines below large tooth, and short, triangular tooth on same side of shaft as serrated margin of blade. Acicula gradually tapered to slender tips; tips often emergent from setal lobes, if not broken, in preserved specimens. Pygidium (Fig. 4G) on specimens

of greater than 10 mm length with pair of long, slender, cirriform or tapered anal cirri; cirri 6–8 times longer than wide, about as long as ventral tentacular cirri of segment 2, but not as stout; often shorter, almost cylindrical on some small specimens.

Proboscis (Fig. 4A, B), observed everted on 2 specimens from North Carolina, dissected on specimen from Florida; dorsal surface with scattered, chitinous papillae, with region of small papillae proximally, then short, smooth region more distally, then papillate region extending toward tip; papillae of distal region smaller proximally, gradually larger distally; 2 pairs of small, subulate, soft papillae laterally at proximal end; lateral and ventral surface proximally smooth, with about 6 indistinct, muscular ribs, changing to 6 rows of rectangular pads medially, then to 4 rows of rectangular pads distally; shape of anterior margin of proboscis when fully everted not satisfactorily observed.

Remarks.—*Paranaitis gardineri* differs from *P. polynoides* (Moore, 1909), to which specimens of *P. gardineri* from North Carolina had been referred, in having dorsal cirri which are not as broad and in having anal cirri which are much longer and more slender. Dorsal cirri of *P. polynoides* are much broader than the lengths of acicula and conceal the parapodia and entire dorsum posteriorly, whereas on *P. gardineri* dorsal cirri are about as broad as the lengths of acicula and leave the middle ¼–⅓ of the body exposed posteriorly. Anal cirri of *P. polynoides* are stout, cylindrical, and about four times longer than wide, whereas anal cirri of *P. gardineri* are slender, gradually tapered, and 6–8 times longer than wide.

The proboscis of the holotype of *P. polynoides* (Moore) is not everted. I dissected a specimen of *P. polynoides* from Puget Sound, Washington, identified by Dr. M. H. Pettibone (USNM 26839), and examined the proboscis. Although I could not exactly determine the details, the proboscis of the dissected specimen appeared similar to that of *P. gardineri.*

Paranaitis gardineri is also similar to *P. kosteriensis* (Malmgren, 1865), but the latter species has spheroidal anal cirri (Bergström 1914).

Etymology.—The species is named in honor of Dr. Stephen L. Gardiner, who was instrumental in collecting the excellent specimens of this and many other species from North Carolina.

Family Hesionidae Sars, 1862

Genus *Heteropodarke* Hartmann-Schröder, 1962

Heteropodarke lyonsi, new species

Figs. 5, 6

Material examined.—FLORIDA EAST COAST: Hutchinson Island Sta II, 27°21.6′N, 80°13.2′W, 11 m, coarse calcareous sand, holotype (USNM 80525), 2 paratypes (USNM 80530; FSBC I 30429), 2 specimens (USNM 80532; FSBC I 30430). Same, Sta III, 27°22.0′N, 80°12.4′W, 7 m, medium calcareous sand, 2 paratypes (BMNH 1983.939; ZMH P-17599), 3 specimens (FSBC I 30431–30433). Same, Sta IV, 27°20.7′N, 80°12.8′W, 11 m, coarse calcareous sand, 6 paratypes (USNM 80527, 85029; AHF Poly 1398; ZMH P-17598), 1 specimen (FSBC I 30434). GULF OF MEXICO (U.S. Bureau of Land Management, Mississippi, Alabama, Florida Study, 1975–76, box core samples): off Florida, Sta 28, 29°55′N, 86°05′W, 38 m, coarse calcareous sand-rubble, 2 paratypes (BMNH 1983.940–

941), 4 specimens (MESC). Same, Sta 29, 29°56′N, 86°06′W, 38 m, coarse calcareous sand-rubble, 6 paratypes (MESC; BMNH 1983.942; ZMH P-17605; FSBC I 30435), 2 specimens (MESC). Same, Sta 30, 29°51′N, 86°06.5′W, 41 m, coarse calcareous sand-rubble, 6 paratypes (MESC; USNM 80526; AHF Poly 1399), 2 specimens (MESC). Same, Sta 31, 29°48′N, 86°09.5′W, 45 m, coarse calcareous sand-rubble, 1 paratype (USNM 80528), 1 specimen (MESC). Same, Sta 32, 29°46′N, 86°12.5′W, 45 m, coarse sand, 3 paratypes (FSBC I 30436, 30437), 3 specimens (MESC). Same, off Alabama, Sta 40, 29°43.5′N, 87°54.5′W, 36 m, coarse sand, 1 specimen (MESC). Same, Sta 41, 29°45.5′N, 87°36.5′W, 37 m, medium sand, 1 paratype (USNM 80531). NORTH CAROLINA: off Beaufort, 34°34′N, 76°25′W, 19 m, fine sand and shell, J. H. Day, coll., BST 88X, 1 paratype (USNM 51078).

Description.—Body without color pattern. Holotype complete, about 8 mm long, 75 setigers; largest paratype (USNM 80530) incomplete, in 2 pieces, about 20 mm long, about 200 setigers; remaining paratypes and specimens incomplete; single large pygidial fragment (USNM 80532). Body almost cylindrical, slightly flattened ventrally. Prostomium slightly longer than wide, rectangular, with broadly rounded corners on specimens with proboscis everted (Fig. 5A), shorter, pyriform on specimens with proboscis inverted (Fig. 5B), ½–⅔ width of body without parapodia. Antennae and palps tapered, not articulated, perhaps pseudoarticulated on few partially dried specimens; lateral antennae attached on anterior margin at about middle of each side, about as long as prostomium; median antenna attached slightly back from anterior margin, slightly shorter than lateral antennae; palps attached on anterior margin on short palpophores at about lateral sides of prostomium, similar to lateral antennae. One or 2 pairs of minute eyespots usually present laterally on posterior ⅓ of prostomium. First segment reduced dorsally, visible only laterally and ventrally; tentacular cirri 4–6 pairs on 2–3 laterally visible, indistinctly marked segments, upper ones on long cirrophores; longest upper ones on segment 2, with about 25 articles, extending to about setiger 6; upper ones on segment 1 about ⅔ as long; upper ones on posterior tentacular segment about ½ as long; lower ones all about same length, ⅓–⅕ length of longest upper ones, with about 10 articles. Parapodia (Figs. 5C, D; 6A–C) lateral on anterior segments, gradually changing to dorsolateral orientation on posterior segments, sesquiramous; each with articulated dorsal and ventral cirri, with blunt neuropodial lobe, with distinct presetal lobe on anterior 3 and middle and posterior setigers, with composite, heterogomph setae consisting of spinigers and falcigers, with blunt-tipped neuroaciculum, with tapered notoaciculum; internal structure of shafts of setae uniform, unmarked, similar to that of Syllidae. Dorsal cirri all similar, on moderately long cirrophores, about twice as long as neuropodial lobes, with up to 15 articles; ventral cirri ⅓–½ as long as dorsal cirri, on short cirrophores, with about half their length extending past neuropodial lobes; notoacicula solitary, short, slender on anterior segments, gradually longer, stouter in middle segments, very stout, emergent, and crossing one another middorsally on posterior segments. Spinigers (Fig. 6F, G) solitary, beginning on setiger 3, continuing to middle of body or beyond, or up to about setiger 80, with blades slightly longer and more strongly serrated on middle segments, aligned above aciculum on posterior side. Falcigers 4–7, almost always 5 per parapodium. Falcigers on setigers 1–3 (Fig. 6D, E) moderately stout; blades with rounded tips, without serrations on margins;

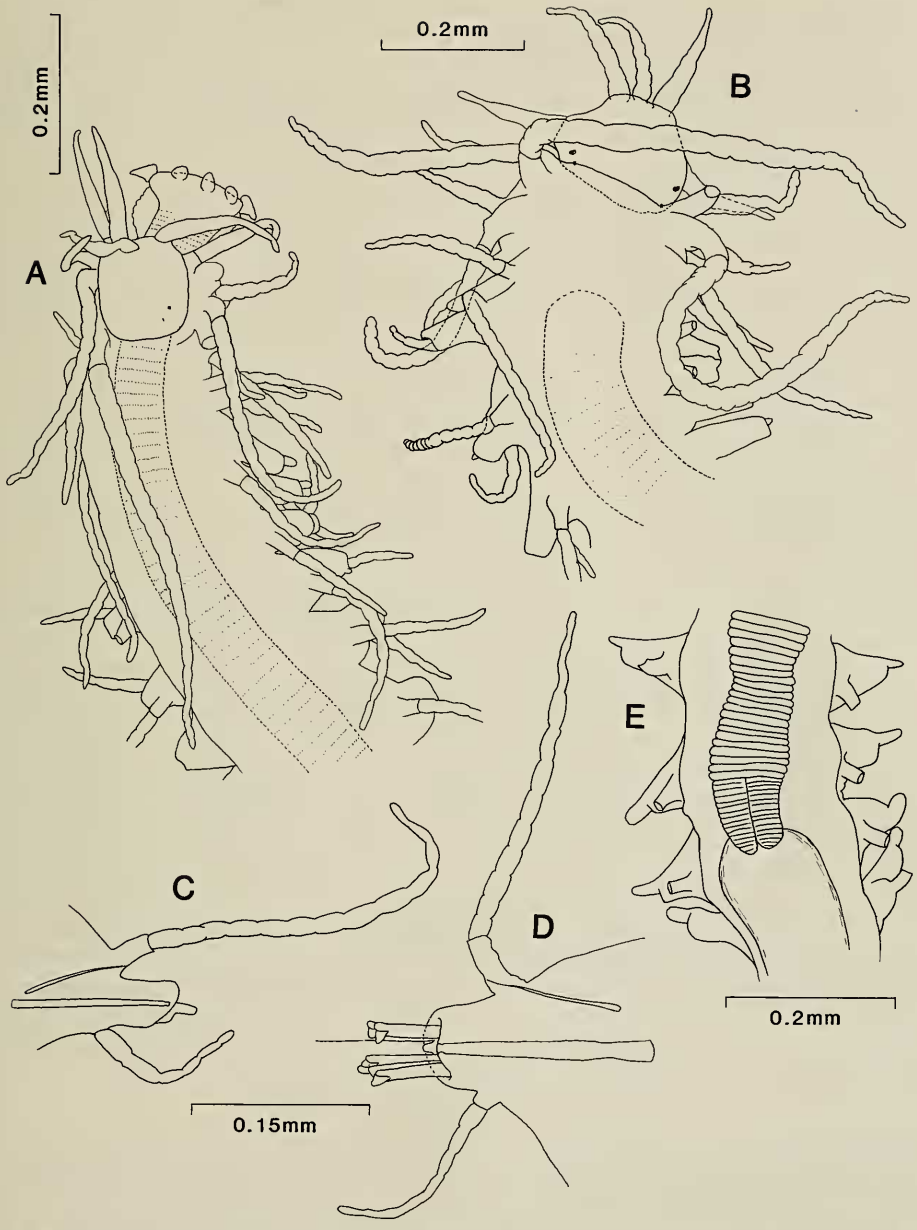

Fig. 5. *Heteropodarke lyonsi*: A, Anterior end, dorsal view, small paratype; B, Same, large paratype; C, Parapodium, setiger 3, posterior view; D, Same from region of enlarged falcigers, anterior view; E, Posterior end of foregut, cirri omitted (A, B, USNM 80529; C, D, AHF Poly 1399; E, holotype).

shafts with bifid tips, with one bifurcation strongly hooked laterally. Very stout golden brown falcigers beginning on setiger 4 (Fig. 6H) and extending for variable number of segments depending on size, maximally to setiger 37 on largest specimen, to setiger 12–37 on all specimens, with rounded or concave-edged, smooth,

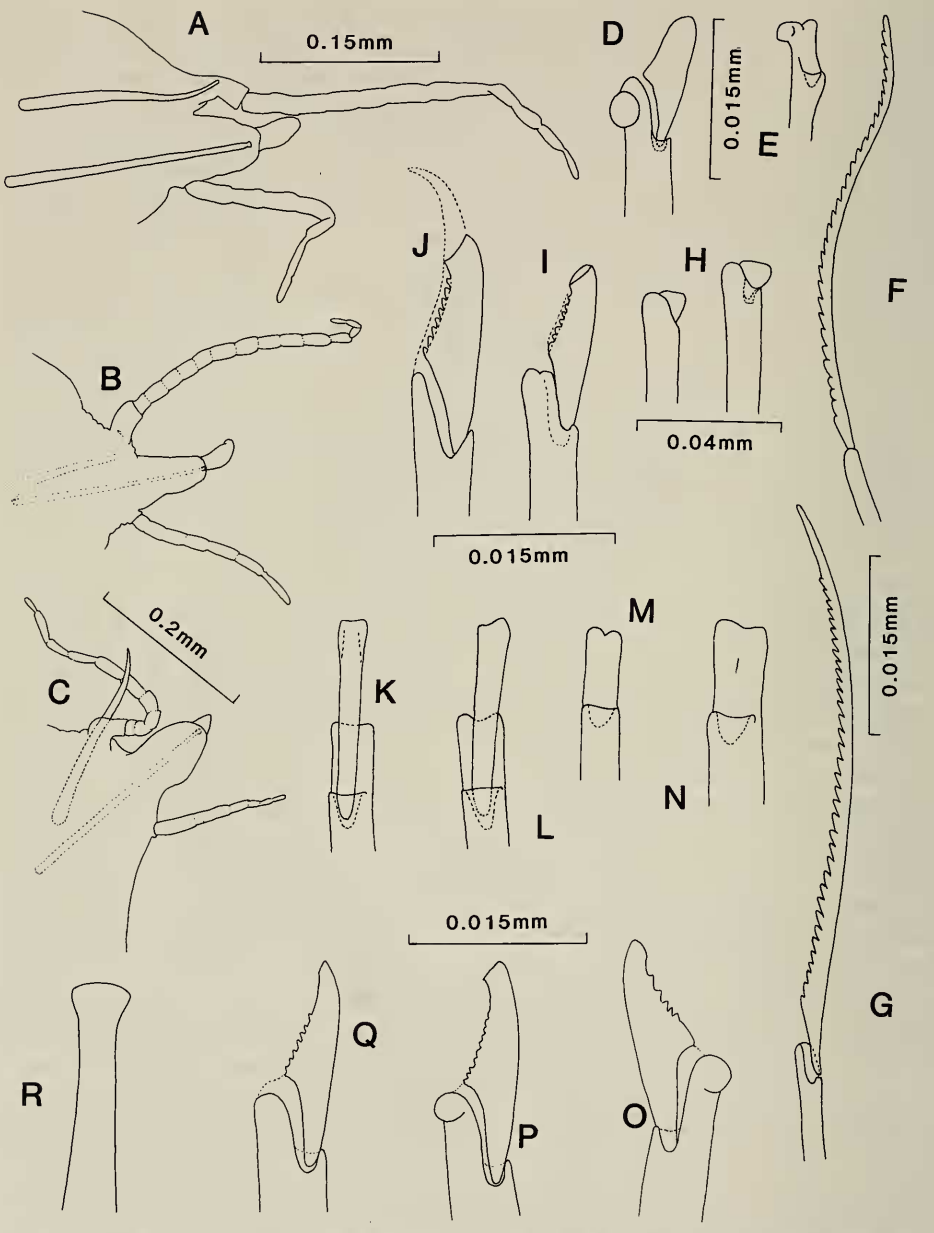

Fig. 6. *Heteropodarke lyonsi*: A, Parapodium, about setiger 50, posterior view; B, Same, setiger 75, posterior view; C, Same, posterior parapodium, posterior view; D, Falciger, setiger 3; E, Shaft of falciger, setiger 3; F, Spiniger, setiger 4; G, Same, middle segment; H, Enlarged falcigers; I, Falciger, setiger 75; J, Subemergent falciger with sickle-shaped hood, setiger 75; K, L, Falcigers, middle segment, face view; M, N, Tips of shafts of falcigers, middle segment, face view; O, Upper falciger, posterior parapodium; P, Subacicular falciger of same; Q, Lower falciger of same; R, Neuroaciculum, setiger 75 (A, AHF Poly 1399; B, C, USNM 80530; D, E, FSBC I 30431; F, G, K–N, FSBC I 30430; H, FSBC I 30433; I, J, O–R, holotype).

triangular blades; blades on setiger 4 twice as large as those on setiger 3, gradually larger to about setiger 10; shafts of very stout falcigers with broadly rounded tips, with diameter greater nearer tips than proximally. Falcigers of middle segments (Fig. 6I–N) with moderately stout blades; blades with hooded tips, with tips straight in lateral view but cupped in face view; tips of shafts slightly bifid, with similar bifurcations; hood of emerging setal blades long, pointed (Fig. 6J). Falcigers of posterior segments (Fig. 6O–Q) with blades more strongly hooked than on middle segments and with smaller, blunt tips or hooded areas, with shafts bifid but with one bifurcation strongly nobbed or hooked as on shafts of anterior-most falcigers. Neuroacicula solitary, very stout on parapodia with very stout falcigers, slightly constricted near tips and nobbed (Fig. 5D); remaining ones more slender with similar tips (Fig. 6R).

Foregut with 10 soft papillae surrounding anterior margin when everted, extending posteriorly to a few segments past segments having very stout falcigers, maximally to about setiger 40, ringed with thick muscle bands (Fig. 5E).

Remarks.—*Heteropodarke lyonsi* is similar to *H. heteromorpha* Hartmann-Schröder, 1962, the type-species, and *H. heteromorpha africana* Hartmann-Schröder, 1974, in having a variable number of tentacular cirri, single spinigers on some but not all parapodia, and greatly enlarged falcigers on anterior parapodia. *Heteropodarke lyonsi* and *H. heteromorpha* have up to six pairs, whereas *H. heteromorpha africana* has up to eight pairs of tentacular cirri. *Heteropodarke heteromorpha* and *H. heteromorpha africana* have spinigers distributed approximately in the region of enlarged falcigers (Hartmann-Schröder 1974; Dorsey 1978), whereas such setae on *H. lyonsi* have a much more extensive distribution, from setiger 3 to about the middle of the body. *Heteropodarke lyonsi* differs from both *H. heteromorpha* and *H. heteromorpha africana* in having enlarged, emergent notoacicula on about the posterior ⅓–¼ of the body. *Heteropodarke heteromorpha* is known from Peru, New Caldonia, and California; *H. Heteromorpha africana* is known from Natal; and *H. lyonsi* is known from North Carolina, the east coast of Florida, and the northeastern Gulf of Mexico.

Etymology.—The species is named in honor of William G. Lyons, Supervisor of Invertebrate Research of the Florida Department of Natural Resources Bureau of Marine Research.

Heteropodarke formalis, new species
Fig. 7

Material examined.—FLORIDA EAST COAST: Hutchinson Island Sta II, 27°21.6′N, 80°13.2′W, 11 m, coarse calcareous sand, holotype (USNM 80533), 81 paratypes (USNM 80536, 80537; AHF Poly 1396; BMNH 1983.943–951; FSBC I 30440, 30441; MESC; ZMC; ZMH P-17606, P-17607), 5 specimens (FSBC I 30438, 30439). Same, Sta IV, 27°20.7′N, 80°12.8′W, 11 m, coarse calcareous sand, 35 paratypes, (AHF Poly 1397; BMNH 1983.952–956; FSBC I 30443–30445; USNM 80535; ZMC), 4 specimens (FSBC I 30442). Same, Sta V, 27°22.9′N, 80°13.9′W, 11 m, coarse calcareous sand, 7 paratypes (FSBC I 30448), 10 specimens (FSBC I 30446, 30447). GULF OF MEXICO (U.S. Bureau of Land Management Mississippi, Alabama, Florida Study, 1975–76, box core samples): Off

Florida, Sta 28, 29°55′N, 86°05′W, 38 m, coarse calcareous sand-rubble, 1 paratype (USNM 80538). Same, Sta 29, 29°56′N, 86°06′W, 38 m, coarse sand-rubble, 1 specimen (MESC). Same, Sta 30, 29°51′N, 86°06.5′W, 41 m, coarse sand-rubble, 2 paratypes (MESC; FSBC I 30449), 2 specimens (MESC). Same, off Alabama, Sta 41, 29°45.5′N, 87°36.5′W, 37 m, medium sand, 1 paratype (MESC). NORTH CAROLINA: off Beaufort, 34°34′N, 76°25′W, 19 m, fine sand and shell, J. H. Day, coll., BST 88X, 1 paratype (USNM 80534).

Description.—Body without color pattern; maximum length about 9 mm, about 0.3 mm wide excluding parapodia, about 0.8 mm wide including parapodia and setae, about 75 setigers; body almost cylindrical, rounded dorsally, flattened ventrally. Prostomium (Fig. 7A) indistinctly bilobed, slightly wider than long, almost straight anteriorly and posteriorly, rounded laterally, almost as wide as body excluding parapodia. Antennae and palps subulate or tapered, irregularly wrinkled, but not articulated; lateral antennae attached near anterolateral margins of prostomium, about as long as prostomial width; median antenna attached on anterior margin, perhaps half as long and much more slender than lateral antennae. Palps attached on short palpophores ventrolateral to lateral antennae, about on line with lateral margins of prostomium, similar and perhaps slightly longer than lateral antennae. Two pairs of small lensed eyes usually present in trapeziform arrangement open anteriorly, near lateral margins of prostomium slightly posterior to midtransverse line. Tentacular cirri articulated, 6 pairs on 3 laterally visible segments, with first not visible dorsally and second and third indistinctly separated from each other dorsally; upper ones all similar, slightly longer than segmental width excluding parapodia, with about 13 articles, attached on moderately long cirrophores; lower ones about half as long, on short cirrophores. Pair of transverse segmental ciliary bands visible dorsally anterior and posterior to parapodia. Parapodia (Fig. 7B, C) similar throughout body, sesquiramous; each with articulated dorsal and ventral cirri, with slender blunt-tipped neuropodium, with papilliform presetal and rounded postsetal lobes, with heterogomph, compound setae consisting of spinigers and falcigers, with blunt-tipped neuroaciculum, with slender, tapered notoaciculum extending into base of dorsal cirrophore; internal structure of shafts of setae uniform, unmarked. Dorsal cirri about as long as body width excluding parapodia, with 10–15 articles, attached on moderately long cirrophores; ventral cirri ½–⅓ as long as dorsal cirri, with about 5 articles, attached directly to about middle of lower side of parapodia. Spinigers (Fig. 7E) on all parapodia, usually solitary, rarely 2, aligned above neuroaciculum, with shafts much more slender but similar to those of falcigers. Falcigers (Fig. 7F–I) 6–8 per parapodium, usually 4 above and 2 below neuroaciculum, slightly stouter on setigers 4 to 12 or 14 (Fig. 7F), but similar to others; blades short, unidentate, with short, triangular serrations; shafts with tips almost equally bifurcate. Neuroacicula of setigers 4–14 slightly stouter than others. Pygidium (Fig. 7D) with pair of anal cirri similar to dorsal cirri.

Foregut not divided into anterior and posterior parts by constriction, extending to about setiger 14, ringed with thick muscle bands, with 10 soft papillae surrounding anterior margin when everted.

Remarks.—*Heteropodarke formalis* differs from other members of the genus in having a constant six pairs of tentacular cirri, in having falcigers only slightly enlarged on some anterior segments, and in having spinigers on all parapodia.

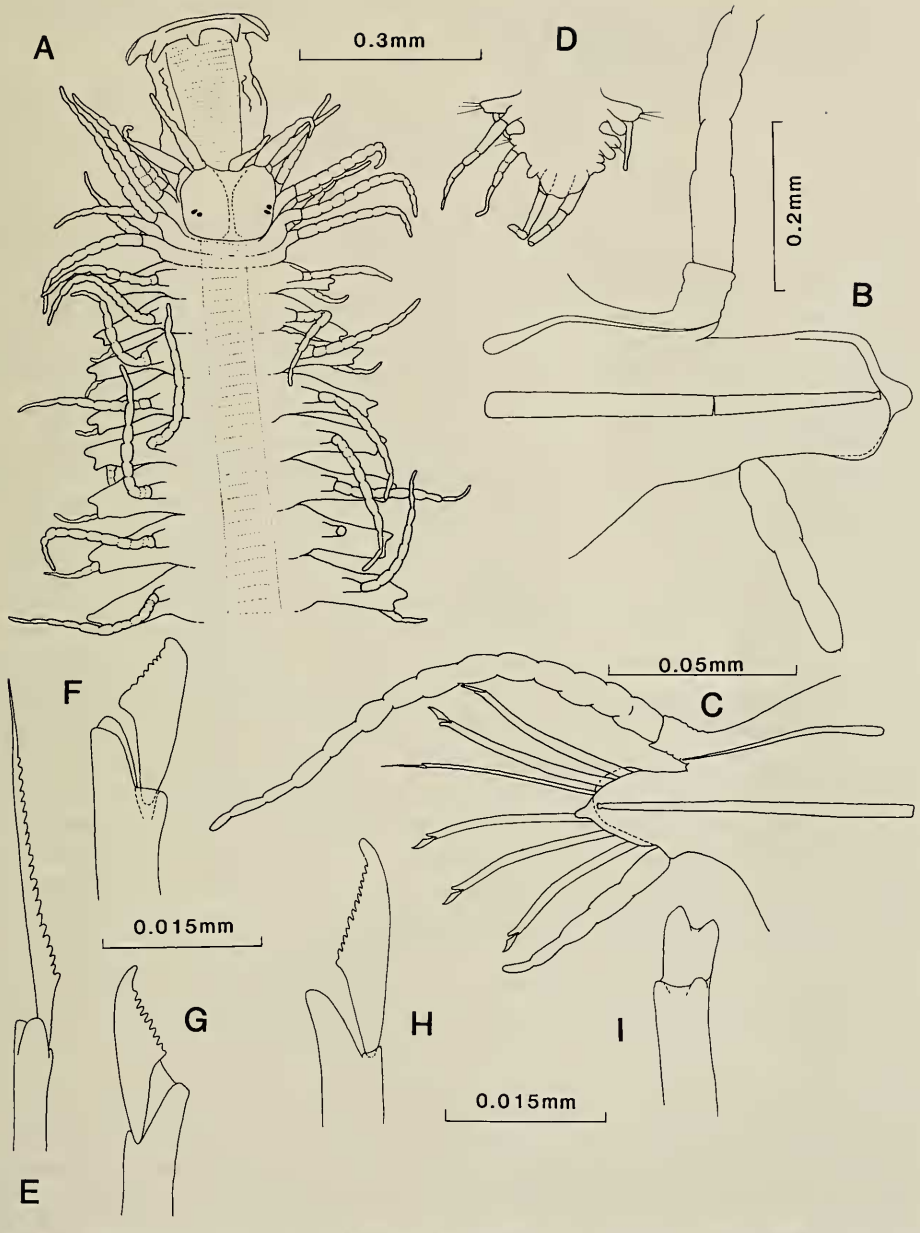

Fig. 7. *Heteropodarke formalis*: A, Anterior end, dorsal view; B, Parapodium, setiger 7, posterior view; C, Same, middle segment, anterior view; D, Posterior end, dorsal view; E, Spiniger, middle segment, blade turned; F, Falciger, setiger 7; G, Same, middle segment; H, Same, posterior segment; I, Tip of shaft of falciger, face view (A, C, D, holotype; E, I, FSBC I 30444; F–H, USNM 80536).

Etymology.—The specific name is derived from the Latin and refers to the lack of variation in the number of tentacular cirri.

Genus *Kefersteinia* Quatrefages, 1865
Kefersteinia haploseta, new species
Fig. 8

Material examined.—FLORIDA: Hutchinson Island Sta II, 27°21.6'N, 80°13.2'W, 11 m, coarse calcareous sand, Applied Biology, Inc., coll., holotype (USNM 80513), paratype (USNM 80514).

Description.—Body without color pattern. Complete paratype about 4.5 mm long, 0.22 mm wide excluding parapodia, 0.64 mm wide including parapodia at setiger 5, 30 setigers; holotype incomplete posteriorly, 29 setigers, about as wide as paratype. Body slightly narrower posteriorly for first 9–10 setigers, widest in middle (from reproductive products), tapered posteriorly. Prostomium (Fig. 8A, B) wider than long, slightly convex anteriorly, anterolaterally straight, rounded posterolaterally on paratype, slightly incised posteriorly on holotype. Antennae originating dorsally near anterior margin at about middle of each side, slender, gradually tapered, about as long as prostomial width; palps originating slightly ventrolateral to antennae; palpophores about twice diameter of antennae, less than half as long; palpostyles oval, slightly longer than palpophores; two pairs of large, lensed eyes on posterior half of prostomium near lateral margins, with anterior and lateral pair larger; nuchal organs behind posterolateral margins of prostomium possible. First tentacular segment reduced, visible only laterally and ventrally (Fig. 8A); three indistinctly marked tentacular segments visible dorsally, with first dorsally visible segment half as long as following one (proboscis everted in both specimens). Tentacular cirri 8 pairs; upper ones all similar, longer than body width including parapodia; lower ones less than half as long; all articulated distally like dorsal cirri, with proximal articles 4 times longer than broad and smooth, with distal articles slightly longer and pseudoarticulated; diameter of dorsal ones 1½ times that of dorsal cirri; diameter of ventral ones slightly less than that of dorsal ones. Parapodia (Fig. 8C) sesquiramous, all similar, shorter on anterior few setigers and on posterior end; each with distinctly articulated dorsal cirrus, with smooth ventral cirrus, with notopodial lobe reduced to notoacicular extending into anterior part of base of dorsal cirrophore, with slender, conical neuropodial lobe, without notosetae, with neurosetae consisting of compound falcigers and slender spines. Dorsal cirri slightly longer than parapodia, on moderately long cirrophores; proximal articles 3–4 times longer than broad, smooth; distal articles longer, indistinctly divided into 4 pseudoarticles. Ventral cirri originating on ventral margins of neuropodia near neurosetae, slender, extending ventrolaterally almost to tips of neuropodia. Neurosetae consisting of long to short-bladed falcigers on first 5 setigers, falcigers and slender spines thereafter (Fig. 8D–G). Falcigers with slender blades; blades shorter above and below, gradually longer near middle, with serrated margins and unidentate, hooded tips; shafts slender, internally cross-barred, with bifid tips. Simple spines solitary, slender, smooth, round-tipped, with embedded part aligned above neuroaciculum on anterior side and separated from fan of falcigers, internally cross-barred; neuroacicula numbering 1–2 in middle parapodia, stouter than notoacicula, pointed, ending

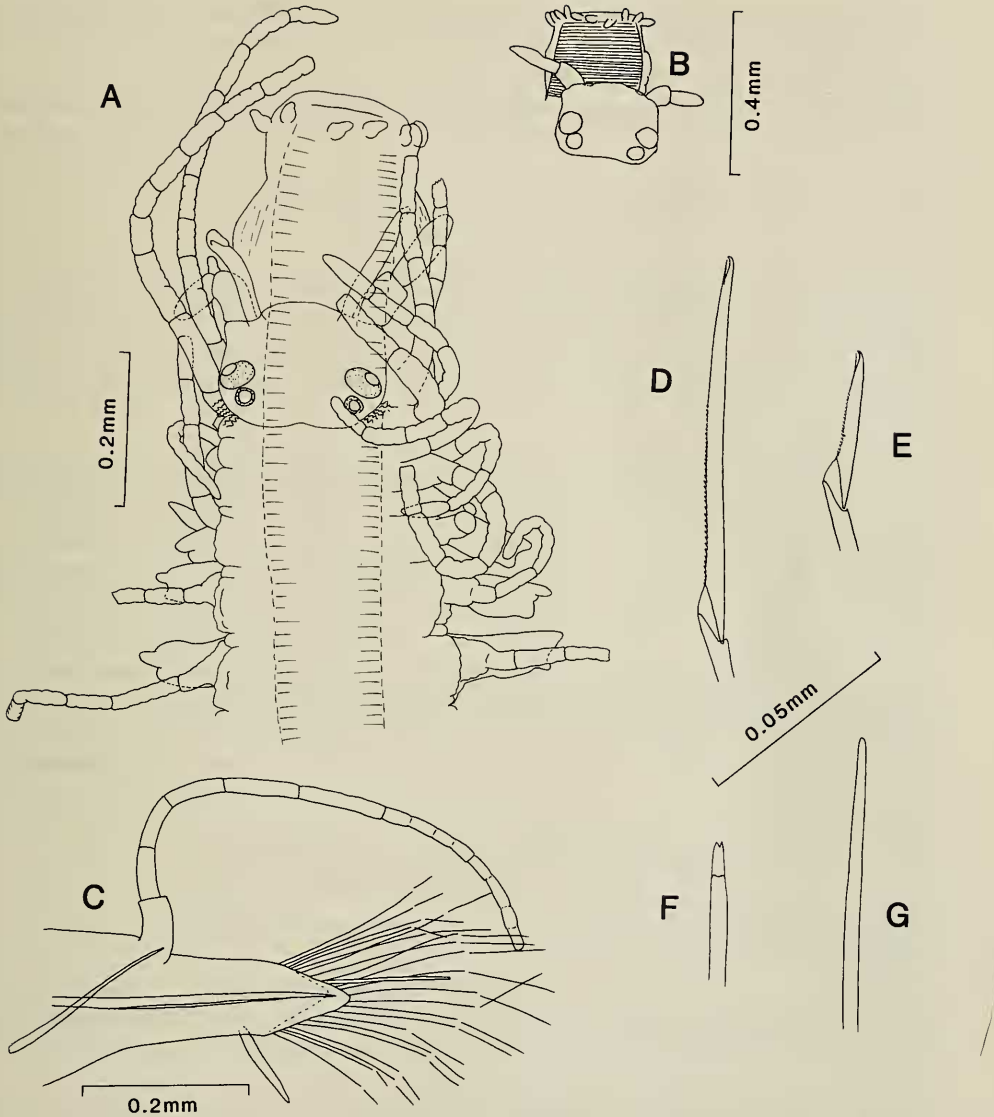

Fig. 8. *Kefersteinia haploseta*: A, Anterior end, dorsal view; B, Prostomium and everted pharynx; C, Parapodium, middle segment, anterior view; D, Compound seta from middle of bundle, middle segment; E, Upper compound seta of same; F, Tip of shaft of compound seta of same; G, Simple seta of same (A, holotype; B–G, paratype).

near tips of presetal lobes, internally cross-barred. Pygidium with pair of long anal cirri similar but slightly stouter than upper tentacular cirri.

Everted proboscis (Fig. 8A, B) with margin surrounded by circle of about 20 papillae on paratype, fewer papillae on holotype; thickly muscled with circular muscle bands, extending to setiger 4 or 5; distal and proximal parts not separated by distinct groove or constriction.

Both specimens sexually mature, but sex undetermined, with reproductive products beginning in setiger 9 or 10 and extending for 10 segments in paratype, to posterior end of incomplete holotype.

Remarks.—Hesionid genera diagnosed by Fauchald (1977:73–77) as having two antennae, eight pairs of tentacular cirri, sesquiramous parapodia and an unarmored pharynx are as follows: *Hesione* Savigny, 1818; *Kefersteinia* Quatrefages, 1865; *Dalhousiella* McIntosh, 1901; and *Wesenbergia* Hartman, 1955. *Hesione* has minute, conical antennae and lacks palps. *Wesenbergia* is similar to *Hesione,* but has a pair of minute, simple palps about the same size and shape as antennae (*Hesionella problematica* Wesenberg-Lund, 1950:14, pl. 3, fig. 15a). *Kefersteinia* and *Dalhousiella* have longer, subulate antennae and biarticulate palps. *Dalhousiella, Hesione* and *Wesenbergia* all have an eversible pharynx which is distally smooth; only *Kefersteinia* has an eversible pharynx surrounded distally by a circlet of papillae.

The type-species of *Kefersteinia* is *Psamathe cirrata* Keferstein, 1862. Descriptions of this species available to me [*Psamathe cirrata.*—Claparède, 1863:55, 56, pl. 14, figs. 1–7; 1868:537; *Kefersteinia cirrata.*—Fauvel, 1923:238–240, Fig. 89a–e, in part (parts comprised of citations of *Kefersteinia cirrata* of Saint-Joseph, 1888, *Castalia fusca* var. of Southern, 1914, and *Kefersteinia cirrata* of Fauvel, 1913, are probably examples of *Hesiospina* Imajima and Hartman, 1964); Hartmann-Schröder, 1971:131, fig. 42] show that *K. cirrata* has the first three segments reduced dorsally and visible only laterally and ventrally. Thus, setae are first present on the second dorsally visible segment rather than on the fourth such segment as diagnosed by Fauchald (1977:76). In contrast to *K. cirrata, Kefersteinia fauveli* Averincev (1972: 146, 147, pl. 20 figs. 1–4; not *K. fauveli* of Hartman, 1978:145–148, fig. 12), and *K. haploseta* have only the first segment dorsally reduced, and *Kefersteinia* sp., described briefly below, has the first two segments dorsally reduced. Although dorsal reduction of anterior segments is usually considered to be an important generic character, the above may represent a continuum of closely related species, and I prefer not to erect another genus without additional evidence.

Further, the distal margin of the pharynx of the type-species is surrounded by a circlet of fimbriae (Fauchald 1977:76), here defined as slender filiform papillae. *Kefersteinia haploseta* and *Kefersteinia* sp. have a circlet of at most about 20 relatively stouter marginal papillae. *Kefersteinia fauveli* has a circlet of 11–12 small marginal papillae and a pair of dorsolateral bunches of 4–5 papillae back from the margin. It is my opinion that differences in number and size of marginal papillae from those of the type-species should not preclude assignment of species to *Kefersteinia.* However, the bunches of papillae back from the margin of the pharynx of *K. fauveli* are apparently unique among Hesionidae, and a re-evaluation of the importance of this character may be required.

Simple neurosetae occurring on most parapodia of *Kefersteinia haploseta* are absent on *K. cirrata, K. fauveli,* and *Kefersteinia* sp., below. Similarly, simple neurosetae are present on *Kefersteinia similis* Hessle, 1925, the type-species of *Hesiospina* Imajima and Hartman, 1964, but Fauchald (1977:76) did not consider such setae to be important enough to include in the diagnosis he gave for that genus. Likewise, I do not consider them to be of generic importance in *Kefersteinia.* However, the position and alignment of these simple setae suggest that they may

be homologous with acicula, and a re-evaluation of the importance of this character also may be required.

Etymology.—The specific name is formed of a combination of the Greek *haplos,* meaning simple, and the Latin *seta,* meaning bristle, and refers to the simple neurosetae of this species.

Kefersteinia sp.
Fig. 9

Material examined.—FLORIDA: Hutchinson Island Sta V, 27°22.9′N, 80°13.9′W, 11 m, coarse calcareous sand, 1 specimen (FSBC I 30450). Gulf of Mexico off S.W. Florida, 25°45.7′N. 83°11.1′W, 54 m, coarse calcareous sand, Mote Marine Laboratory personnel, coll., 3 specimens (USNM 80512; MML).

Diagnosis.—Complete specimen 6 mm long, 1.1 mm wide, 40 segments. Prostomium (Fig. 9A) longer than wide, with 4 eyes; all antennae lost; nuchal organs present. All tentacular cirri lost; first 2 segments reduced dorsally. Parapodia (Fig. 9B) similar to those of *K. cirrata* (Keferstein); dorsal cirri indistinctly articulated proximally, medially with long distinct articles formed of four indistinct pseudoarticles, distally distinctly articulated. Setae all compound falcigers (Fig. 9C–F), all hooded, almost all with bidentate blades, few ventral ones with unidentate blades; shafts with bifid tips.

Remarks.—This species differs from *K. cirrata* and *K. haploseta* in having falcigers with bidentate blades and from *K. fauveli* in lacking dorsolateral bunches of papillae back from the margin of the pharynx. It is not named because material is inadequate.

Genus *Podarkeopsis* Laubier, 1961
Podarkeopsis levifuscina, new species
Fig. 10

Gyptis vittata.—Taylor, 1971:155–159.—Day, 1973:25.—Hall and Saloman, 1975: 11 [list] [not Webster and Benedict, 1887].

Gyptis brevipalpa.—Gardiner, 1976:119, 120, figs. 8q–t, 9a [not *Oxydromus brevipalpa* Hartmann-Schröder, 1959].

Material examined.—NORTH CAROLINA: Cape Lookout, intertidal, sand mixed with gravel and shell fragments, S. L. Gardiner, coll., 10 Nov 1973, holotype (USNM 52897). Banks Channel, Wrightsville Beach, intertidal, in burrow of *Glycera robusta,* Gardiner, coll., Feb 1972, 1 paratype (USNM 52895). Intracoastal Waterway, Wrightsville Beach, intertidal, in burrow of *Leptosynapta tenuis,* T. Fox, coll., Mar 1973, 1 paratype (USNM 52896). FLORIDA EAST COAST: Hutchinson Island Sta II, 27°21.6′N, 80°13.2′W, 11 m, coarse calcareous sand, 1 paratype (ZMH P-17601). Same, Sta III, 27°22.0′N, 80°12.4′W, 7 m, medium calcareous sand, 1 paratype (FSBC I 30451). Same, Sta IV, 27°20.7′N, 80°12.8′W, 11 m, coarse calcareous sand, 1 paratype (AHF Poly 1392). Same, Sta V, 27°22.9′N, 80°13.9′W, 11 m, coarse calcareous sand, 9 paratypes (BMNH 1983.957; FSBC I 30452–30454; USNM 55586, 55587; ZMC). GULF OF MEXICO: Florida, U.S. National Marine Fisheries Service Tampa Bay Area Study, 1963–64, C. H. Saloman and J. L. Taylor, coll., exact locality unknown, 9 paratypes (USNM 45531).

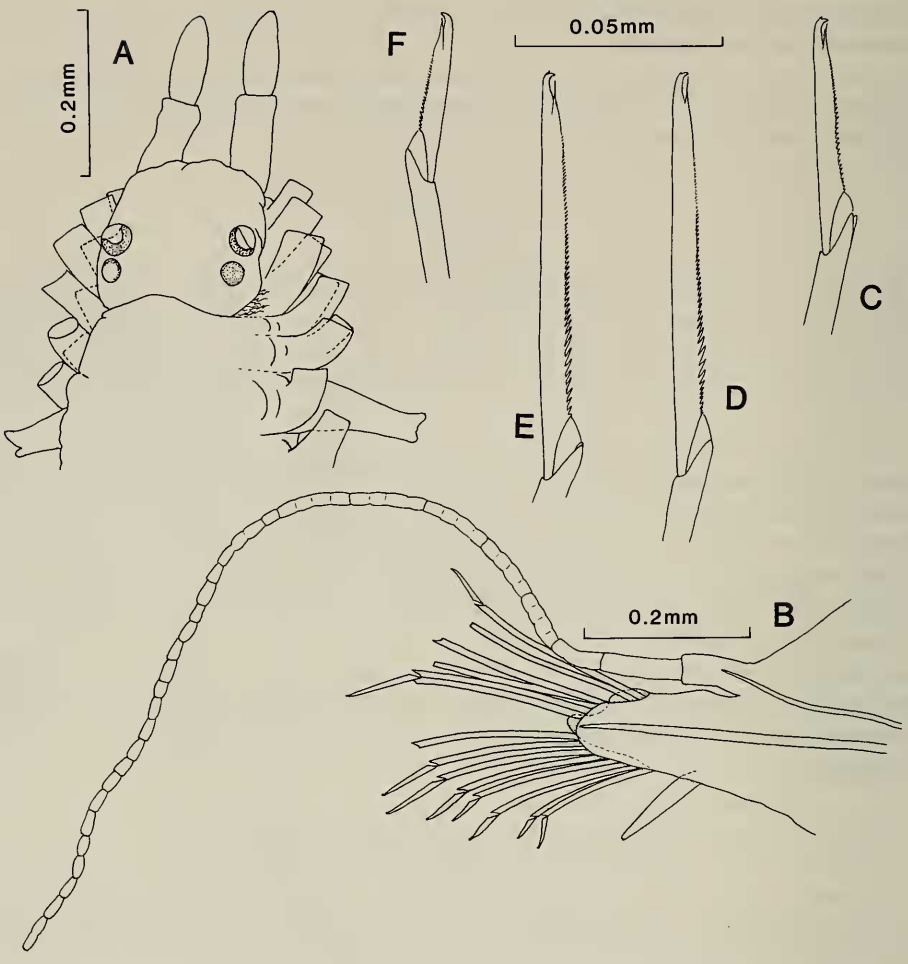

Fig. 9. *Kefersteinia* sp.: A, Anterior end, dorsal view; B, Parapodium, middle segment, posterior view; C, Upper seta, middle segment; D, Lower seta of upper group, middle segment; E, Upper seta of lower group, middle segment; F, Lower seta, middle segment (A, B, USNM; C–E, FSBC I).

Same, Hillsborough Bay, 5 paratypes (AHF Poly 1393; BMNH 1983.958–959). Same, Upper Tampa Bay, 10 paratypes (AHF Poly 1395; FSBC I 12054; ZMH P-17603). Same, Old Tampa Bay, 22 paratypes (AHF Poly 1394; BMNH 1983.960–963; FSBC I 10375; ZMC; ZMH P-17604). Same, Boca Ciega Bay, 1 paratype (ZMC). Anclote Anchorage, Tarpon Springs, Pinellas County, 28°12.6′N, 82°47.6′W, 3.5 m, 4 paratypes (FSBC I 17397).

Description.—Usually without color pattern; body of one paratype (USNM 52895) tinged with scattered brown pigment spots dorsally, more prominent laterally above parapodia. Maximum length greater than 18 mm, width 2 mm including parapodia, about 60 segments; body broadest anteriorly, gradually tapered posteriorly, almost cylindrical but flattened ventrally. Prostomium (Fig. 10A, B) slightly wider than long, concave anteriorly, rounded laterally, covered posteriorly by fold of second segment, ⅔–¾ as wide as body excluding parapodia.

Median antenna originating just below anterior margin, short, ⅓ as long as lateral antennae, about half as broad, fusiform, broader proximally and gradually tapered or acuminate distally; lateral antennae originating below anterior margin about ⅓ distance from middle to lateral margins, about twice as thick as median antenna at base, about half as thick as palps, gradually tapered, about ⅔ as long as prostomium and equal in length to palps; antennae perhaps irregularly wrinkled, but not articulated. Palps attached below lateral antennae, each with broad palpophore ⅔ of total length and narrow, rounded palpostyle. Two pairs of moderately large, lensed eyes near lateral margins on posterior half of prostomium, in trapezoidal arrangement open anteriorly, anterior ones about twice as large as posterior ones. Ciliated nuchal organs present laterally between prostomium and tentacular segments. First tentacular segment (Fig. 10A, B) reduced dorsally, visible only laterally and ventrally, 3 indistinctly marked tentacular segments visible dorsally; tentacular cirri 8 pairs, distinctly to very indistinctly articulated, with articles shorter than broad; dorsal tentacular cirri longest on segment 2, extending to setiger 8–11, about half as long on segment 1, ⅔–¾ as long on segment 4, those on segment 3 about as long as on segment 1; ventral tentacular cirri on segment 1 about half as long as dorsal ones on same, about same length on segment 2, perhaps slightly longer on segment 4, about ⅔ as long as ventral cirri of segment 1 on segment 3; upper tentacular cirrophores long, perhaps ⅔ length of anterior parapodia, each housing tips of 2–3 slender acicula on larger specimens, 1–2 on smaller ones. Lower tentacular cirrophores shorter, shortest on segment 3, slightly longer on segments 1, 2 and 4; acicula not observed except in segment 1. Parapodia sesquiramous on setigers 1–4, biramous and similar in all remaining setigers (Fig. 10C), each with dorsal and ventral cirri, with small rounded notopodial lobes anteroventrally on tips of dorsal cirrophores beginning on setiger 5, with conical neuropodial lobes, with triangular presetal and rounded postsetal lobes, with notosetae consisting of simple spines and forked setae (Fig. 10D–H), with neurosetae consisting of compound falcigers (Fig. 10I–K), with slender, pointed notoacicula extending into dorsal cirrophores on setigers 1–4 and into bases of notopodial lobes beginning on setiger 5, and with slender, pointed neuroacicula extending into neuropodial lobes. Dorsal cirri smooth to indistinctly articulated, on moderately long cirrophores; relative lengths of dorsal cirri of anterior setigers, often obscured by regeneration or loss, as follows: cirri of setiger 1 about ⅓ as long as upper tentacular cirri of segment 1; cirri of setiger 2 abruptly shorter than those of setiger 1; following cirri gradually longer to setiger 4; cirri of setiger 4 slightly shorter than cirri of setiger 1; cirri of setiger 5 slightly shorter than cirri of setiger 4; following cirri gradually longer to setiger 8; cirri of setiger 8 similar in length to cirri of setiger 4; cirri of setiger 9 slightly shorter than cirri of setiger 8 on some specimens; remaining cirri more or less similar to those of setiger 8, slightly exceeding or exceeding tips of neuropodial lobes by up to almost ½ their length on middle segments. Ventral cirri smooth, originating at about midlength of neuropodial lobes near posterior side, usually directed ventrally, not exceeding tips of neuropodial lobes on anterior and middle segments, similar in length to those before but exceeding tips of neuropodial lobes on posterior segments. Notopodial spines (Fig. 10G, H) numbering 1–3, extending from upper part of notopodial lobe, moderately stout to slender, stiff, smooth with rounded tips; forked setae (Fig. 10D–F) below spines, numbering 4–8, slender, each with bifid-long

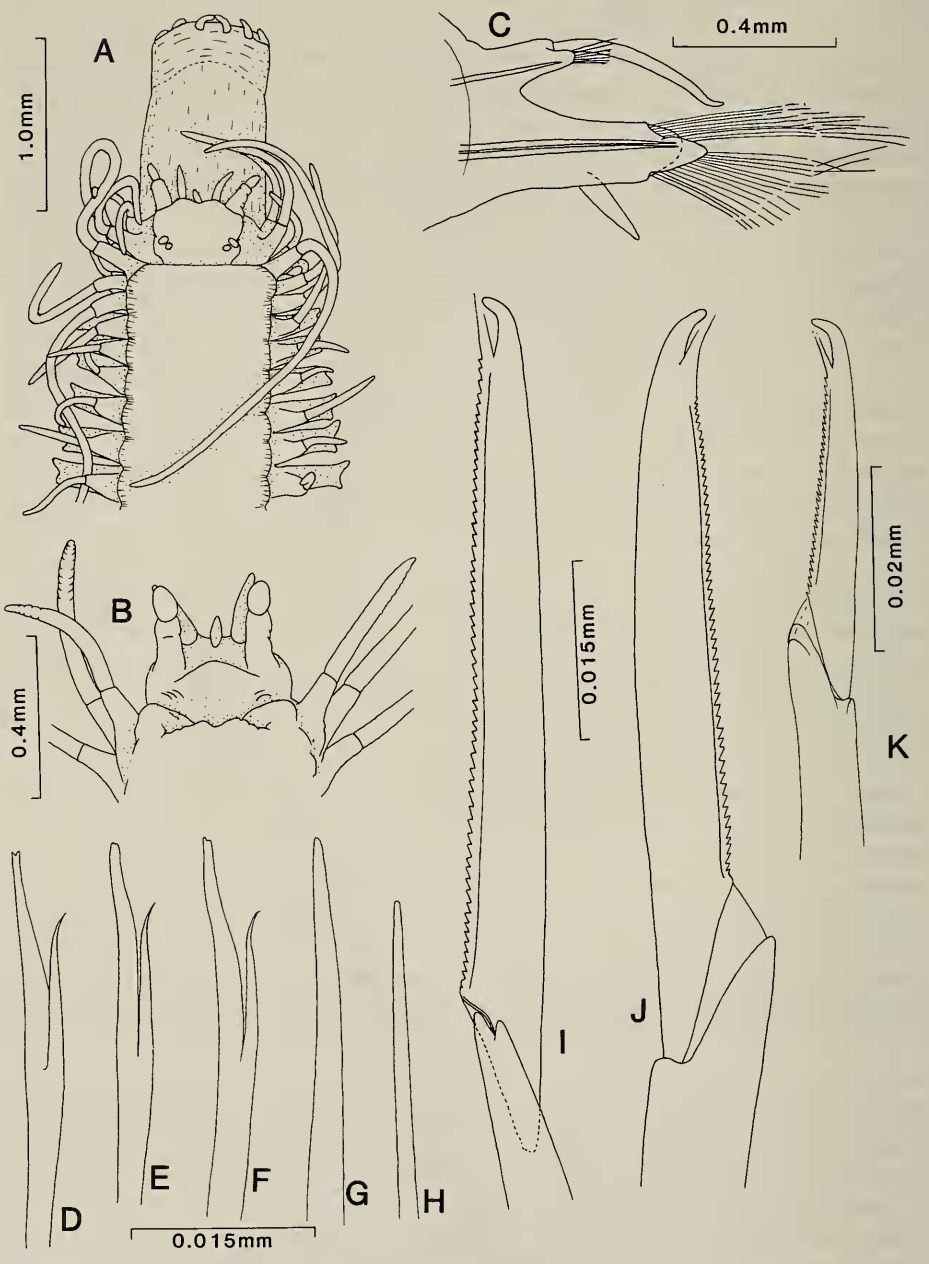

Fig. 10. *Podarkeopsis levifuscina*: A, Anterior end, dorsal view; B, Same, ventral view, proboscis inverted; C, Parapodium, middle segment; D, Notopodial forked seta, middle segment, slightly turned; E, F, Same, in lateral view; G, Stout simple notopodial spine, middle segment; H, Slender spine of same; I, Compound neuroseta, upper group, middle segment; J, K, Same, lower group (A, I, J, USNM 52895; B, holotype; C, F, K, FSBC I 12054; D, E, G, H, BMNH 1983.957).

tine, with pointed short tine, without serrations on shaft proximal to tip of short tine. Neurosetae consisting of numerous compound heterogomph falcigers (Fig. 10I–K), separated into upper and lower groups by acicula; blades moderately short above and below, long in middle, longest in lower part of upper group, with hooded, hooked, unidentate tips and finely serrated borders; shafts long, smooth with notched tips; hoods on few falcigers long, pointed, completely covering and exceeding tips of blades. Notoacicula in parapodia of setigers 1–4 numbering 2–3 on large specimens, 1–2 on small specimens, single thereafter; neuroacicula numbering 2 per parapodium in middle segments.

Foregut moderately long, extending through setigers 1–10 in holotype (inverted), through segments 1–6 in small specimens, to setiger 7 or 8 in large specimens with proboscis completely everted (USNM 52895), ringed with thick muscle bands, divided into anterior and posterior parts when everted by more or less distinct transverse groove or constriction, with anterior border when everted surrounded by 10 moderately long, conical soft papillae.

Remarks.—In defining the monotypic genus *Podarkeopsis,* Laubier emphasized the importance of notopodial forked setae as a generic character on the type-species, *P. galangaui* Laubier, 1961. Presence of such setae has not been considered an important generic character in the Hesionidae, but, in conjunction with other characters, this character appears to establish the close phylogenetic relationship of a widely distributed group of species and tends to support the correctness of Laubier's arguments regarding its importance.

Previously described species herein referred to *Podarkeopsis* Laubier are *Oxydromus brevipalpa* Hartmann-Schröder (1959:105–197; *Gyptis brevipalpa.*—Banse and Hobson, 1968:12, 13, in part, fig. 3B–E), *Oxydromus arenicolus glabrus* Hartman (1961:68, 69; *Gyptis brevipalpa.*—Banse and Hobson, 1968:12, 13, in part, fig. 3F–H), *Oxydromus capensis* Day (1963:397, fig. 4E–J; *Gyptis capensis.*—Day 1967:231, 232, fig. 11.2. L–O.—Gibbs and Probert, 1973:397, 398, fig. 2A;?in part), and *Gyptis maraunibinae* Gibbs (1971:137, 138, fig. 5).

Banse and Hobson (1968) examined types of *Podarkeopsis glabrus* (Hartman), new combination, and referred the species to *P. brevipalpa* (Hartmann-Schröder). Forked setae of the two species, which were first described by Banse and Hobson for *P. glabrus* and by Hartmann-Schröder in Banse and Hobson (1968) for *P. brevipalpa,* are distinctly different, and in my opinion the two species are not the same. Gibbs and Probert (1973) examined the holotype of *Podarkeopsis capensis* (Day). The forked setae they described resemble those of *P. galangaui* Laubier, and thus the two species may be the same. However, Laubier's figure of the anterior end of *P. galangaui* (Laubier 1961: fig. 1A) and Day's figure of the anterior end of *P. capensis* (Day 1967: fig. 11.2.N) suggest differences that may involve two species. Day's figure shows the first two segments to be dorsally reduced, whereas Laubier's figure shows only the first tentacular segment to be reduced dorsally. The two figures also suggest differences in relative lengths of tentacular cirri and dorsal cirri between *P. galangaui* and *P. capensis.* Therefore, I tentatively continue to consider them separate species. *Podarkeopsis maraunibinae* (Gibbs) apparently differs from *P. brevipalpa* in having enlarged papillae on the anterior end of the proboscis and smooth notopodial spines.

Podarkeopsis levifuscina differs from other members of the genus in having

unique notopodial forked setae on which short prongs are smooth and long prongs are bifid. Notopodial spines of *P. levifuscina* are similar to those of *P. capensis, P. galangaui* and *P. maraunibinae* in being smooth. Arrangement of tentacular and dorsal cirri appears similar to that of *P. capensis.*

Etymology.—The specific name is derived from the Latin *levis,* meaning smooth, and *fuscina,* meaning a three-pronged spear or trident, and refers to the forked setae.

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